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species. A much smaller species is the *Cicindela punctulata* Olivier (Fig. 7), which is dark bronze, and spotted on the elytra with white dots, in place of the more usual white dots and curved lines or lunules.

GEOLOGY.

THE CRINOIDAL BANKS OF CRAWFORDSVILLE, INDIANA.—Montgomery County, of which Crawfordsville is the county seat, belongs to the Sub-carboniferous formation, being just north of the northern out-crop of the Indiana and Illinois coal-fields. A large part of the country is covered with heavy drift. Rocks in place, however, crop out abundantly along Rock (Sugar Creek on some maps) River and its tributaries. These rocks are rich in fossils characteristic of the Sub-carboniferous strata: varieties of *Productus*, *Spirifer*, *Terebratula*, *Conularia*, etc.

But the fossils which have excited the most interest, and which have rendered this locality specially noted, are the beautiful Crinoidæ. Along the banks of this river are strata of limestone, made up almost entirely of the broken stems and arms of Crinoids, cemented by carbonate of lime, and occasionally containing heads finely preserved.

But the geological horizon in which the heads of Crinoids are mostly found, is a calcareous shale or sandstone, of quite limited vertical extent, not much exceeding two feet in thickness, and often but six or eight inches. In this the Crinoids are abundant, and in great perfection, the arms and basal plates being well preserved, with stems attached, and not unfrequently even the finest tentacula. They are mostly of the following types: *Actinocrinus*, *Cyathocrinus*, *Agaricocrinus*, *Platycrinus*, *Forbesiocrinus*, *Scapiocrinus*, *Zeacrinus*, and *Pentremites*. These Crinoid beds have been wrought by some of the citizens of Crawfordsville for fifteen or twenty years, prominent among whom, as most persevering and entitled to the greatest credit, both for exploring and working out specimens, is Mr. O. W. Corey. He has furnished beautiful specimens to the Smithsonian Institution, Harvard University, Yale College, Michigan University, Wabash College, and also to many private cabinets. These beds have been explored also by the students and professors of Wabash College, who have enriched her cabinet with choice specimens. The College secured, by purchase of Mr. Corey, several hundreds of perfect heads, finely wrought out, fit for the cabinet. The bank nearest to Crawfordsville is the most productive, but the same strata are found cropping out at Island Ford, on Offil's Creek, on Walnut Fork, on Black Creek, as well as at several other points on Rock River.

The most extensive excavations have been made by Mr. Charles

Dyer, of Cincinnati, an enthusiastic collector of Western fossils, some years since, and quite recently by Mr. Frank H. Bradley, of New Haven, a successful collector of specimens of Natural History. This bank is situated half a mile north of the city, in a bluff seventy-five feet above the bed of the river. The out-cropping has been so far explored, that deep and heavy excavations are requisite to reach the Crinoidal horizon.

Crinoids or Encrinites are radiates belonging to the class of Echinoderms, found chiefly fossil and extinct, there being but two living species, the *Comatula* and *Pentacrinus Caput Medusæ*. They are so named from their resemblance in form to the lily. They are among the most beautiful and wonderful fossils we have.

The Encrinite consists of a calcareous root, a hollow jointed stem, a vasiform, or cup-shaped base upon its top, from which proceed arms with subdivisions; upon some of the arms are found very fine tentacula. Besides the fixed Crinoids, there are others which were free, and some imbedded in mud.

Crinoids exist most abundantly in the oldest fossiliferous rocks, belonging to the Palæozoic and Mesozoic periods; so abundant are they in some localities in the Palæozoic localities, as to give character to the rocks, as Crinoidal or Encrinital limestone. They are found among the earliest of fossil animals. For a long time their animal origin was disputed, till established by Rosinus, in 1719.

A large proportion of the genera described belong to the Silurian formation. The Palæozoic species amount to about five hundred, and those in the rocks above to nearly one hundred.—E. O. HOVEY, *Wabash College*.

MICROSCOPY.

THE SURFACE FAUNA OF MID-OCEAN.—In the sixth volume of the "London Microscopical Journal," Major S. R. J. Owen describes several forms of towing nets for collecting microscopic forms at sea. By such nets the Polycystina, with their interesting allies the Acanthometra, and the Thalassicola, can be found:—

"I am persuaded that the genera *Pulvinulina* and *Globigerina*, of the family Colymbitæ of the Foraminifera, will be found on the surface of the ocean near home. Dr. Wallich found them in great numbers in the sediment forming the bed of the Atlantic. From seventy to ninety-eight per cent. of this deposit in the deep seas is often composed of these Rhizopods. These two genera, together with the *Orbulina* of Dr. Carpenter, but which I have now proved to be a sub-genus of *Globigerina*, have been found to be surface-forms on every part of the ocean that I have sailed over. Different classes of creatures will be found on the surface during the night to those found in the daytime: from sunset till daylight the Polycystina, Foraminifera, Acanthometra, Entomostraca, Small Pteropods, and Shelled Mollusca must be looked for; during the day the Crustaceans, Thalassicola, Cressis, etc., will repay our endeavors."